

Working Group B - Data Representation Model & Interchange Language

June 20, 2001



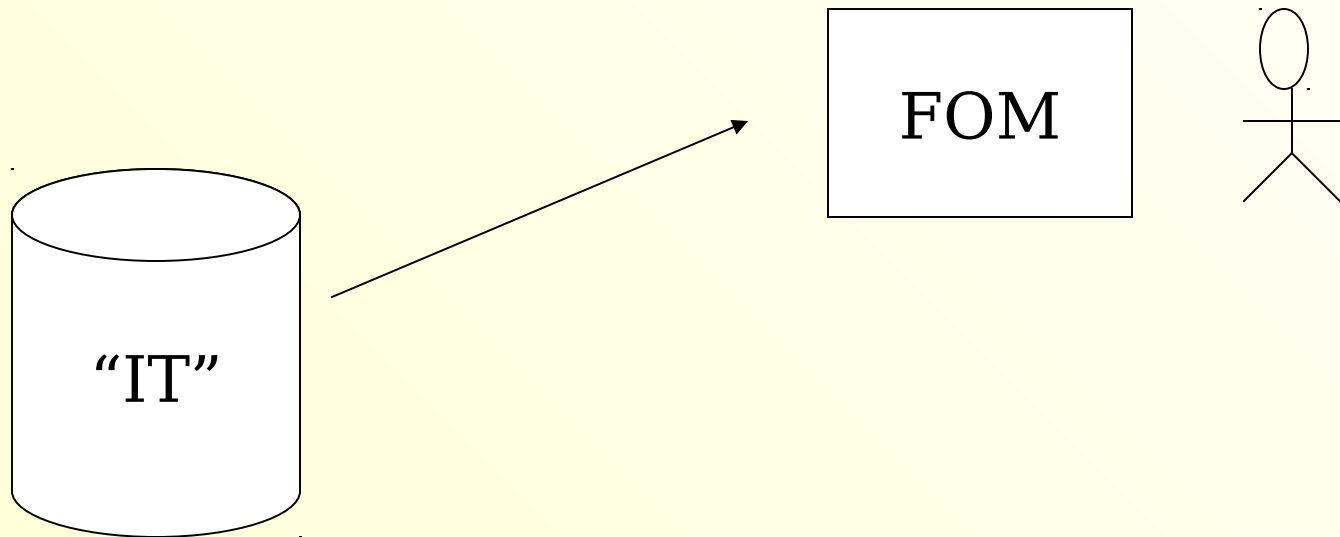
Participants

- **Dan Croghan**
- **Dr. Michael Fineberg**
- **Dr. Avelino Gonzalez**
- **Dr. Norm Badler**
- **Lee Lacy**
- **Dr. Lashon Booker**
- **LTC Raymond Hill**
- **Dr. John Costandi**
- **Dr. Ronald Chong**
- **Tom Hughes**

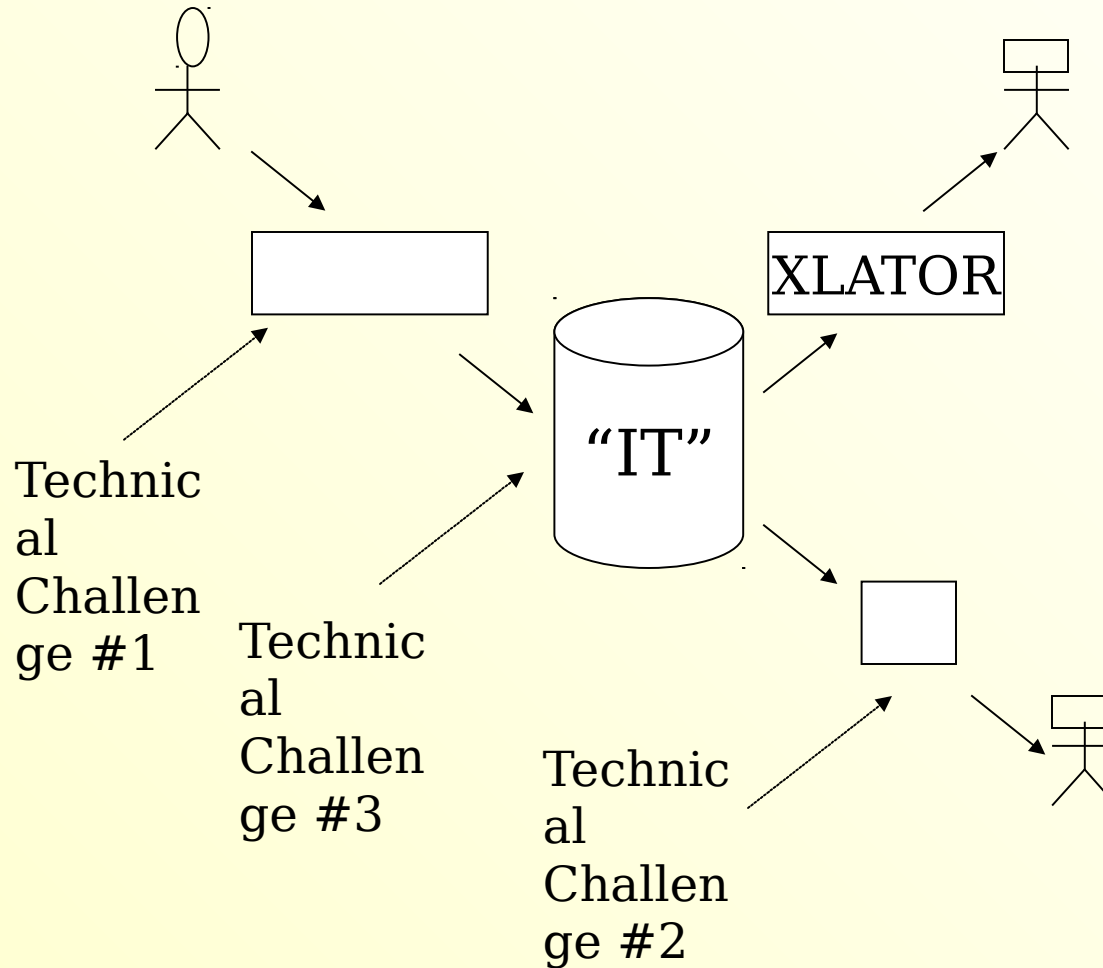
Vision

- **Near Term (2-5 years) (interface-oriented)**
 - Plug and Play (complete agents)
 - HBR FOM+
- **Far Term (10+ years) (interchange-oriented)**
 - Plug and Play (cognitive components)
 - Standardized interchange format for behavioral knowledge

Interface



Interchange



“Pros”

- **open up competition to people to come up with a better model without having to write everything**
- **ability to federate HBRs**
- **reuse makes it better, faster and cheaper**
- **open up collaboration**
- **support more robust communication between agents/HBRs**
- **existence proof - feasible for implementation - and making a standard**
- **reusable data and knowledge repositories**
- **common language and behavior - standardized definitions and behaviors**
- **allows for standardized representation- improve product - facilitates communication in modeling community**

“Pros” (continued)

- **cheaper**
- **improves bounds on outcomes (better bound solution space involving decision making)**
- **leverage COTS**
- **give industry a target for new developments**
- **provide a principal approach for putting behavior models into FOMs together**
- **repository of human performance algorithms - characterized by stressors, behaviors and tasks**
- **if TTPs are accessible that might translate out to better vehicle for training community- gives more communication amongst community of developer and user (HBR expert to tank trainer)**
- **enhance validation**
- **enables autonomous agents to access authoritative representations**

“Cons”

- **no real defined areas like the environment - much harder to define**
- **lacking representation definition (how do you know its an F16 pilot?)**
- **exploratory research needed to build the needed algorithms (how behavior relates to task, relates to stress, etc)**
- **knowledge domains we need to consider are potentially unbounded**
- **conversion and accommodation of existing legacy systems**
- **semantics are context specific/sensitive**
- **no generally accepted models of what is in the brain (compared to physics or env)**
- **implementation mechanisms are too varied**
- **set of actions for a given level of fidelity are undefined**

“Cons” (continued)

- **bounding the range would limit creativity for new solutions**
- **too much to be able to verify or validate anything**
- **ability to model local interactions isn't commensurate with ability to model global effects (propagate)**
- **size of the software and the speed at which it executes is a concern for real time simulation - at least now not necessarily in 10 years**
- **identifying a meaningful data structure that can accommodate the range of implementation approaches**
- **might not be able to get heterogeneous HBRs to work together.**
- **Not enough research about human behavior to put a taxonomy on the social behaviors (emotions, etc)**
- **Attempt to support an immature science - hard to build on top of it**

Research Programs

- **Near Term**

- **Develop initial base representation**
- **Expand Functional Description of the Mission Space (FDMS)**
- **Provide Starter HBR FOM**
- **Experiment**

- **Long Term**

- **Develop Universal Interchange Model**

Benefits

- **Near Term**

- **Open Standard**
- **Competitive Environment**
- **Improve Models**

Conclusions

- **Benefits**
- **Feasible**
- **Should proceed**